SEQUENCE LISTING

<110> Board of Trustees Operating Michigan State University
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<120> Expression of a Recombinant Transgene

<130> 6550-000072/US/NPB

<140> US 10/561,720
<141> 2005-12-22

<150> PCT/US04/21451
<151> 2004-07-02

<150> US 60/485,073
<151> 2003-07-03

<160> 19

<170> PatentIn version 3.5

<210> 1
<211> 26
<212> DNA
<213> Cowpea chlorotic mottle virus

<400> 1
aagtggatcc cctcttgtgc ggctgc 26

<210> 2
<211> 16
<212> DNA
<213> Cowpea chlorotic mottle virus

<400> 2
actccaaaga gttctt 16

<210> 3
<211> 835
<212> DNA
<213> Cauliflower mosaic virus

<400> 3
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cagcaggtct catcaagacg atctacccga gcaataatct ccaggaaatc aaataccttc 120

ccaagaaggt taaagatgca gtcaaaagat tcaggactaa ctgcatcaag aacacagaga 180

aagatatatt tctcaagatc agaagtacta ttccagtatg gacgattcaa ggcttgcttc 240

acaaaccaag gcaagtaata gagattggag tctctaaaaa ggtagttccc actgaatcaa 300

aggccatgga gtcaaagatt caaatagagg acctaacaga actcgccgta aagactggcg 360

aacagttcat acagagtctc ttacgactca atgacaagaa gaaaatcttc gtcaacatgg 420

tggagcacga cacacttgtc tactccaaaa atatcaaaga tacagtctca gaagaccaaa 480

gggcaattga gacttttcaa caaagggtaa tatccggaaa cctcctcgga ttccattgcc 540

cagctatctg tcactttatt gtgaagatag tggaaaagga aggtggctcc tacaaatgcc 600

atcattgcga taaaggaaag gccatcgttg aagatgcctc tgccgacagt ggtcccaaag 660

atggaccccc acccacgagg agcatcgtgg aaaaagaaga cgttccaacc acgtcttcaa 720

agcaagtgga ttgatgtgat atctccactg acgtaaggga tgacgcacaa tcccactatc 780

cttcgcaaga cccttcctct atataaggaa gttcatttca tttggagaga acacg 835

<210> 4
<211> 581
<212> DNA
<213> Encephalomyocarditis virus

<400> 4
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gccggtgtgc gtttgtctat atgttgtttt ccaccatatt gccgtctttt ggcaatgtga 120

gggcccggaa acctggccct gtcttcttga cgagcattcc taggggtctt tcccctctcg 180

ccaaaggaat gcaaggtctg ttgaatgtcg tgaaggaagc agttcctctg gaagcttctt 240

gaagacaaac aacgtctgta gcgacccttt gcaggcagcg gaaccccca cctggcgaca 300

ggtgcctctg cggccaaaag ccacgtgtat aagatacacc tgcaaaggcg gcacaacccc 360

agtgccacgt tgtgagttgg atagttgtgg aaagagtcaa atggctctcc tcaagcgtat 420

tcaacaaggg gctgaaggat gcccagaagg taccccattg tatgggatct gatctggggc 480

ctcggtgcac atgctttaca tgtgtttagt cgaggttaaa aaaacgtcta ggccccccga 540

accacgggga cgtggttttc ctttgaaaaa cacgatgata a 581

<210> 5
<211> 581
<212> RNA
<213> Encephalomyocarditis virus

<400> 5
aauuccgccc cucucccucc ccccccccua acguuacugg ccgaagccgc uuggaauaag 60

gccgguguge guuugucuau augugauuuu ccaccauauu gccgucuuuu ggcaauguga 120

gggcccggaa accuggcccu gucuucuuga cgagcauucc uaggggucuu uccccucucg 180

ccaaaggaau gcaaggucug uugaaugucg ugaaggaagc aguuccucug gaagcuucuu 240

gaagacaaac aacgucugua gcgacccuuu gcaggcagcg gaaccccca ccuggcgaca 300

ggugccucug cggccaaaag ccacguguau aagauacacc ugcaaaggcg gcacaacccc 360

agugccacgu ugugaguugg auaguugugg aaagagucaa auggcucucc ucaagcguau 420

ucaacaaggg gcugaaggau gcccagaagg uaccccauug uaugggaucu gaucuggggc 480

cucggugcac augcuuuaca uguguuuagu cgagguuaaa aaaacgucua ggccccccga 540

accacgggga cgugguuuuc cuuugaaaaa cacgaugaua a 581

<210> 6
<211> 581
<212> DNA
<213> Encephalomyocarditis virus

<400> 6
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ttttaacctc gactaaacac atgtaaagca tgtgcaccga ggccccagat cagatcccat 120

acaatggggt accttctggg catccttcag ccccttgttg aatacgcttg aggagagcca 180

tttgactctt tccacaacta tccaactcac aacgtggcac tggggttgtg ccgcctttgc 240

aggtgtatct tatacacgtg gcttttggcc gcagaggcac ctgtcgccag gtgggggttt 300

ccgctgcctg caaagggtcg ctacagacgt tgtttgtctt caagaagctt ccagaggaac 360

tgcttccttc acgacattca acagaccttg cattcctttg gcgagagggg aaagacccct 420

aggaatgctc gtcaagaaga cagggccagg tttccgggcc ctcacattgc caaaagacgg 480

caatatggtg gaaaatcaca tatagacaaa cgcacaccgg ccttattcca agcggcttcg 540

gccagtaacg ttaggggggg gggagggaga ggggcggaat t 581

<210> 7
<211> 581
<212> RNA
<213> Encephalomyocarditis virus

<400> 7
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uuuuaaccuc gacuaaacac auguaaagca ugugcaccga ggccccagau cagaucccau 120

acaaugggguu accuucuggg cauccuucag ccccuuguug aauacgcuug aggagagcca 180

uuugacucuu uccacaacua uccaacucac aacguggcac ugggguugug ccgccuuugc 240

agguguaucu uauacacgug gcuuuuggcc gcagaggcac cugucgccag gugggggguu 300

ccgcugccug caaagggucg cuacagacgu uguuugucuu caagaagcuu ccagaggaac 360

ugcuuccuuc acgacauuca acagaccuug cauuccuuug gcgagagggg aaagaccccu 420

aggaaugcuc gucaagaaga cagggccagg uuuccgggcc cucacauugc caaaagacgg 480

caauauggug gaaaaucaca uauagacaaa cgcacaccgg ccuuauucca agcggcuucg 540

gccaguaacg uuaggggggg gggagggaga ggggcggaau u 581

<210> 8
<211> 242
<212> DNA
<213> Cowpea chlorotic mottle virus

<400> 8
agtgcccgct gaagagcgtt acactagtgt ggcctacttg aaggctagtt ataaccgttt 60

ctttaaacgg taatcgttgt tgaaacgtct tccttttaca agaggattga gctgcccttg 120

ggttttactc cttgaaccct tcggaagaac tctttggagt tcgtaccagt acctcacata 180

gtgaggtaat aagactggtg ggcagcgcct agtcgaaaga ctaggtgatc tctaaggaga 240

cc 242

<210> 9
<211> 242
<212> RNA
<213> Cowpea chlorotic mottle virus

<400> 9
agugcccgcu gaagagcguu acacuagugu ggccuacuug aaggcuaguu auaaccguuu 60

cuuuaaacgg uaaucguugu ugaaacgucu uccuuuuaca agaggauuga gcugcccuug 120

gguuuuacuc cuugaacccu acggaagaac ucuuuggagu ucguaccagu accucacaua 180

gugagguaau aagacuggug ggcagcgccu agucgaaaga cuaggugaug ucuaaggaga 240

cc 242

<210> 10
<211> 242
<212> DNA
<213> Cowpea chlorotic mottle virus

<400> 10
ggtctcctta gagatcacct agtctttcga ctaggcgctg cccaccagtc ttattacctc 60

actatgtgag gtactggtac gaactccaaa gagttcttcc gaagggttca aggagtaaaa 120

cccaagggca gctcaatcct cttgtaaaag gaagacgttt caacaacgat taccgtttaa 180

agaaacggtt ataactagcc ttcaagtagg ccacactagt gtaacgctct tcagcgggca 240

ct 242

<210> 11
<211> 242

<212> RNA
<213> Cowpea chlorotic mottle virus

<400> 11
ggucuccuua gagaucaccu agucuuucga cuaggcgcug cccaccaguc uuauuaccuc 60

acuaugugag guacugguac gaacuccaaa gaguucuucc gaaggguuca aggaguaaaa 120

cccaagggca gcucaauccu cuuguaaaag gaagacguuu caacaacgau uaccguuuaa 180

agaaacgguu auaacuagcc uucaaguagg ccacacuagu guaacgcucu ucagcgggca 240

cu 242

<210> 12
<211> 12
<212> DNA
<213> Artificial

<220>
<223> Artificial sequence used to show antisense relationship of a gene and IRES to a promoter and viral 3' UTR

<220>
<221> misc_feature
<222> (1)..(3)
<223> n is a, c, g, or t

<400> 12
nnncatggaa tt 12

<210> 13
<211> 12
<212> DNA
<213> Artificial

<220>
<223> Complement of artificial sequence used to show antisense relationship of a gene and IRES to a promoter and viral 3' UTR

<220>
<221> misc_feature
<222> (10)..(12)
<223> n is a, c, g, or t

<400> 13
aattccatgn nn 12

<210> 14
<211> 12
<212> RNA
<213> Artificial

<220>

<223> Transcript of RNA polymerase

<220>
<221> misc_feature
<222> (1)..(3)
<223> n is a, c, g, or u

<400> 14
nnncauggaa uu 12

<210> 15
<211> 12
<212> RNA
<213> Artificial

<220>
<223> Complement of transcript of RNA polymerase

<220>
<221> misc_feature
<222> (10)..(12)
<223> n is a, c, g, or u

<400> 15
aauuccaugn nn 12

<210> 16
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> DNA Construct containing promoter complementary coding sequence, exemplary IRES complementary sequence and a viral 3' UTR in 5' - 3' orintation

<220>
<221> misc_feature
<223> DNA construct wherein YYY indicates complementary first translatable codon after initiation codon and an asterisk indicates a stop codon.

<400> 16
yyycatggaa tt 12

<210> 17
<211> 12
<212> DNA
<213> Artificial Sequence

<220>
<223> DNA Construct containing promoter, coding sequence, exemplary IRES sequence and a viral 3' UTR in 3' - 5' orintation

<220>
<221> misc_feature
<223> DNA construct wherein XXX indicates first translatable codon
after initiation codon and an asterisk indicates a stop codon.

<400> 17
yyygtacctt aa 12

<210> 18
<211> 12
<212> RNA
<213> Artificial Sequence

<220>
<223> RNA Construct containing complementary coding sequence, exemplary
IRES complementary sequence and a viral 3' UTR in 5' - 3'
orintation

<220>
<221> misc_feature
<223> Recombinant RNA sequence where YYY is the complement of the first
codon after the initiation codon and where an asterisk indicates
a stop codon.

<400> 18
yyycauggaa uu 12

<210> 19
<211> 12
<212> RNA
<213> Artificial Sequence

<220>
<223> RNA Construct containing viral 3' UTR, exemplary IRES sequence
and a coding sequence in 5' - 3' orientation

<220>
<221> misc_feature
<223> Complementary sequence (sense strand) of RNA recombinant sequence
where XXX is the first translatable codon after initiation codon
and where an asterisk indicates a stop codon.

<400> 19
aauuccaugy yy 12